

MEDIA WITH CONTROLLABLE REFRACTIVE PROPERTIES**ABSTRACT OF THE DISCLOSURE**

An apparatus includes a 3D array of circuit elements and control lines for coupling a remote control device to the circuit elements in the array. Each circuit element is configured to transform from one circuit state to another circuit state in response to a change in a control signal received from one of the control lines. The 3D array includes a region that behaves as a metamaterial in a selected frequency when the circuit elements of the region are in one set of circuit states and as a normal refractive medium in the selected frequency when the circuit elements of the region are another set of circuit states.